IN THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1-36. (Canceled).

37. (Previously Presented) A microprocessor comprising:

a register storing a register value corresponding to a threshold temperature;

a programmable thermal sensor receiving the register value, wherein the programmable thermal sensor generates a first interrupt signal if a microprocessor temperature exceeds the threshold temperature corresponding to the register value;

clock circuitry for providing a clock signal for the microprocessor; and

a processor unit coupled to the clock circuitry, wherein the processor unit executes instructions to vary the frequency of the clock signal in response to the first interrupt signal.

38. (Previously Presented) The microprocessor of claim 37 further comprising:

a fail-safe thermal sensor generating a fail-safe interrupt signal if the microprocessor temperature exceeds a fail-safe threshold temperature, wherein the processor unit is halted in response to the fail-safe interrupt signal.

39. (Previously Presented) The microprocessor of claim 37 wherein the clock circuitry further comprises a phase locked loop.

40. (Previously Presented) The microprocessor of claim 37 wherein the thermal sensor comprises:

a current source;

a voltage reference coupled to the current source to provide a bandgap reference voltage, wherein the bandgap reference voltage is substantially constant over a range of temperatures;

programmable circuitry providing an output voltage varying with the microprocessor temperature in accordance with the register value; and

a comparator, wherein the comparator generates the first interrupt signal if a difference between the output voltage and the bandgap reference voltage indicates that the threshold temperature has been exceeded.

5 41. (Previously Presented) The microprocessor of claim 40 wherein the programmable circuitry further comprises:

a transistor coupled to the current source to provide the output voltage, a gain ratio of the output voltage to a junction voltage of the transistor controlled by a transistor bias, wherein the junction voltage varies in accordance with a junction temperature of the transistor, the junction temperature corresponding to the microprocessor temperature;

a bias circuit providing the transistor bias to control the gain ratio, wherein the output voltage varies with the microprocessor temperature in accordance with the register value.

6 42. (Previously Presented) The microprocessor of claim 41 wherein the bias circuit further comprises binary weighted resistors.

7 43. (Previously Presented) A computer system comprising:

an active cooling device;

a microprocessor comprising:

a register storing a register value corresponding to a threshold temperature;

a programmable thermal sensor receiving the register value, wherein the programmable thermal sensor generates a first interrupt signal if a microprocessor temperature exceeds the threshold temperature,

wherein the active cooling device is activated in response to the interrupt signal.

8 ~~44~~. (Previously Presented) The computer system of claim ~~43~~ 7 wherein the active cooling device comprises a fan.

9 ~~45~~. (Previously Presented) The computer system of claim ~~44~~ 8 further comprising:

clock circuitry for providing a clock signal for the microprocessor, wherein a frequency of the clock signal is reduced in response to the first interrupt signal.

10 ~~46~~. (Previously Presented) The computer system of claim ~~45~~ 9 wherein the clock circuitry further comprises:

a first clock;

a frequency divider coupled to the first clock to provide the clock signal, the frequency divider reducing a frequency of the clock signal in response to the interrupt signal; and

a second clock circuit coupled to provide the clock signal to the microprocessor.

11 ~~47~~. (Previously Presented) The computer system of claim ~~46~~ 10 wherein the microprocessor further comprises:

a processor unit coupled to the second clock circuit, wherein the processor unit executes instructions to vary the frequency of the clock signal from the second clock circuit in response to the first interrupt signal.

12 ~~48~~. (Previously Presented) The computer system of claim ~~47~~ 11 wherein the processor unit programs the register with another register value corresponding to another threshold temperature in response to the first interrupt signal.

13 ~~49~~. (Previously Presented) A method of controlling a temperature of a microprocessor, wherein the microprocessor performs the steps comprising:

a) generating a temperature signal within the microprocessor indicative of the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal if the temperature signal indicates that the first threshold temperature level has been exceeded; and

d) decreasing a microprocessor clock frequency in response to the interrupt signal.

14 ~~50~~. (Previously Presented) The method of claim ~~49~~ 13 further comprising the steps of:

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature; and

f) halting the microprocessor, if the temperature signal indicates that the second threshold temperature level has been exceeded.

15 ~~51~~. (Previously Presented) A method of controlling a temperature of a microprocessor, wherein the microprocessor performs the steps comprising:

a) generating a temperature signal within the microprocessor corresponding to the temperature of the microprocessor;

b) comparing the temperature signal with a first threshold temperature level within the microprocessor;

c) generating an interrupt signal if the temperature signal indicates that the first threshold temperature level has been exceeded; and

d) activating an active cooling device to decrease the microprocessor temperature in response to the interrupt signal.

16 52. (Previously Presented) The method of claim 15 51 wherein the active cooling device is a fan.

17 53. Previously Presented) The method of claim 15 51 further comprising the steps of:

e) comparing the temperature signal with a second threshold temperature level, wherein the second threshold temperature level represents a fail-safe temperature;

f) halting the microprocessor, if the temperature signal indicates that the second threshold temperature level has been exceeded.

54-60. (Canceled):